



PATENT
Attorney Docket No. 189405

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

HAGENBUCH et al.

Application No. 09/333,379

Filed: June 15, 1999

For: PROCESS FOR THREE-DIMENSIONAL
MODELING AND DESIGN OF OFF-
HIGHWAY DUMP BODIES

RECEIVED

JAN 24 2002

Art Unit: 3612

Technology Center 2100

Examiner: Unassigned

RECEIVED

JAN 22 2002

GROUP 3600

PENDING CLAIMS AFTER ENTRY OF PRELIMINARY AMENDMENT

1. A body of a vehicle for hauling material, the body made by the following process:
 - (a) determining a desired location for a load center of gravity on a chassis of the haulage vehicle;
 - (b) determining a desired volumetric capacity for the body;
 - (c) establishing an initial line for a floor of the body, an initial line for a front wall of the body and an initial inside body width;
 - (d) developing a three dimensional volumetric model of a load to be carried in the body defined by the initial floor line, the initial front wall line and the initial inside body width using data collected from an anticipated point of use with the three dimensional volumetric model having a volume and a volumetric model center of gravity located on the chassis;
 - (e) adjusting a set of design parameters of the body until the load model center of gravity is located proximate the desired location for the load center of gravity on the chassis from step (a) and the volume of the three dimensional volumetric model is substantially similar to the desired volumetric capacity from step (b); and
 - (f) producing the body in accordance with the set of design parameters.
2. The invention according to claim 1 wherein the set of design parameters of the body includes a position of the body floor and a position of body sidewalls.
3. The invention according to claim 2 wherein the position of the body floor includes a length of the floor.

4. The invention according to claim 2 wherein the position of the body sidewalls includes a height of the sidewalls.

5. The invention according to claim 4 wherein the position of the body sidewalls further includes a distance between the respective sidewalls.

6. The invention according to claim 2 wherein the set of design parameters of the body further includes a position of the body front wall.

7. The invention according to claim 4 further including the step of adjusting the length of the body floor and the height of the body sidewalls to provide the lowest practical vertical location for the center of gravity of the three dimensional model of the hauled material.

8. The invention according to claim 1 wherein the data collected from the anticipated point of use includes angles of material repose of an actual load carried in an existing vehicle body.

9. The invention according to claim 8 wherein the angles of material repose include a front angle of material repose, a rear angle of material repose and side angles of the material repose.

10. The invention according to claim 9 wherein the field collected data further includes a representation of corner voids present in an actual load carried in an existing vehicle body.

11. The invention according to claim 10 wherein the field collected data includes angles of material repose of and representations of corner voids present in actual loads carried in a plurality of existing vehicle bodies.

12. The invention according to claim 1 wherein the field collected data further includes a density of the load material.

13. The invention according to claim 10 wherein the field collected data further includes a method for loading material into an existing vehicle body.

14. The invention according to claim 10 wherein the step of developing the three dimensional volumetric model of a load to be carried in the body includes modeling the corner voids of the hauled material.

15. The invention according to claim 14 wherein the corner voids of the hauled material are modeled through a gradual incremental blending of the respective side angles of material repose to the front angle of material repose and a gradual incremental blending of the respective side angles of material repose to the rear angle of material repose through respective corners of the three-dimensional model of the hauled material.

16. The invention according to claim 14 further including the step of comparing the modeled corner voids with the field collected representation of the corner voids and adjusting the modeled corner voids as necessary such that the modeled corner voids substantially match the representation of the corner voids.

17. The invention according to claim 15 wherein the incremental blending of the side angles of material repose to the front and rear angles of material repose includes dividing the respective corners of the three-dimensional model into equal segments, establishing a plane in each of these segments at a respective angle which allows an incremental change in the angles of material repose through the corners of the three dimensional model and extending the planes until they intersect the perimeter of the body.

18. The invention according to claim 1 wherein the step of developing the three dimensional volumetric model of a load to be carried in the body includes modeling the corner voids of the hauled material.

19. The invention according to claim 1 further including the step of adjusting the set of design parameters to provide the lowest practical vertical location for the center of gravity of the three dimensional model of the hauled material.

20. The invention according to claim 1 further including the step of adjusting the set of design parameters to allow material to be loaded into the dump body from the lowest practical vertical location.